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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/667,424	09/21/2000	Yoshiyuki Sogawa	32405W043	8861

7590

09/02/2005

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EXAMINER

SELBY, GEVELL V

ART UNIT

PAPER NUMBER

2615

DATE MAILED: 09/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/667,424

Applicant(s)

SOGAWA, YOSHIYUKI

Examiner

Gevell Selby

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-7,9,10,13,16,21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-7,9,10,13,16,21 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/19/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see the amendment, filed 4/15/05, with respect to the rejection(s) of claim(s) 1,3,5-7,9,10,13, and 16 under 35 U.S.C 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Burt US 5,473,364 and Iijima et al., US 6,236,748.

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 22 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitations of claim 22 are not disclosed in the specification on page 9 line 21 to page 10, line 8 as suggested by the applicant in the amendment filed 4/15/05 nor is there a description else where in the specification for the following limitations:

“wherein said angles of inclination of said main camera and said sub-camera correspond to a displacement between a first line on said reference image and a second line on said reference image, said first line is a line for setting a three-dimensional distance distribution, generating area on said reference image substantially symmetrical on left and right sides with respect to said first line in said reference image said second line is a vertical line perpendicular to said optical axis of said main camera in said reference image.”

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 adds the limitation that the first acute angle is larger than the second acute angle which contradicts the limitation of claim 9, from which claim 10 depends, which claims the first acute angle is smaller than the second acute angle. The first acute angle cannot be both smaller and larger than the second acute angle. For examination purposes, the term “larger” in claim 10, will be amended to “smaller”.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 1, 3, 5-7, 9, 10, 13, 16, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burt US 5,473,364 in view of Iijima et al., US 6,236,748.**

In regard to claim 1, Burt US 5,473,364, discloses a stereo camera apparatus (see figure 4) comprising:

a main camera for taking a photograph of an object (see figure 4B, element 400-1 and column 5, lines 53-55); and

a sub-camera for taking photograph of said object from a point of view different from a point of view of said main camera (see figure 4B, element 400-2 and column 5, lines 53-55),

said main camera and said sub-camera being disposed with respect to each other by a predetermined spacing, a shooting direction of said stereo camera is substantially perpendicular to said predetermined spacing in a baseline between the main camera and the sub camera (see figure 4B, elements 400-1 and 400-2 and column 5, line 40-43),

image processing means (see figure 5, element 504),

wherein optical axes of said main camera and said sub-camera are inclined toward the main camera side with a predetermined angle with respect to the

shooting direction defined by each of the optical axes and the shooting direction (see figure 4A and column 5, line 43-45: The camera are adjustable and figure 4A discloses the cameras inclined towards the main camera's (400-1) side),

wherein angles of inclination of said main camera and said sub-camera are set to be such angles that said three-dimensional distance distribution is substantially left-right symmetric with respect to the shooting direction (see figure 4a: It is inherent that when the cameras are substantially left-right symmetric as in figure 4a, the three-dimensional distance distribution produced by the stereo matching will also be left-right symmetric).

The Burt reference does not disclose the image processing means calculates a three-dimensional distance distribution of said object based on a positional difference between a region in a reference image photographed by said main camera and a corresponding area in a comparative image photographed by said sub-camera to an image signal of said region wherein said corresponding area is searched in a strip-like search area having a predetermined length which extends from a position substantially corresponding to said region, said positional difference is obtained from an area which is capable of setting said search area inside of said comparative image.

The Burt reference does not disclose the image processing means calculates a three-dimensional distance distribution of said object based on a positional difference between a region in a reference image photographed by said main camera and a corresponding area in a comparative image photographed by

said sub-camera to an image signal of said region wherein said corresponding area is searched in a strip-like search area having a predetermined length which extends from a position substantially corresponding to said region, said positional difference is obtained from an area which is capable of setting said search area inside of said comparative image.

Iijima et al., US 6,236,748, discloses the image processing means (see column 4, lines 4-11) for calculating a three-dimensional distance distribution of said object based on a positional difference between a region in a reference image (left image) photographed by said main camera and a corresponding area in a comparative image (right image) photographed by said sub-camera to an image signal of said region wherein said corresponding area is searched in a strip-like search area (search range b) having a predetermined length which extends from a position substantially corresponding to said region, said positional difference is obtained from an area which is capable of setting said search area inside of said comparative image (see figure 9 A & B and column 7, line 56 to column 8, lines 30).

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Burt US 5,473,364 in view of Iijima et al., US 6,236,748, to have the image processing means of claim 1, in order to quickly match corresponding position a set of image to create accurate data for stereo matching.

In regard to claim 3, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus as recited in claim 1, wherein the optical axis of

said sub camera is inclined toward said sub-camera side with respect to the optical axis of said main camera (see Burt: figure 4A).

In regard to claim 5, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus as recited in claim 1, further comprising:

a camera stay (see figure 4b, element 414) for mounting said cameras thereon, wherein a longitudinal direction of said camera stay is substantially perpendicular to the shooting direction (see column 5, lines 40-43).

In regard to claim 6, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus of claim 1. The Burt reference lacks CCD cameras. Iijima et al., US 6,236,748, discloses a stereo video camera apparatus wherein both cameras are CCD cameras (see figure 2, elements 13L & R column 3, lines 43-46).

It would have been obvious to a person skilled in the art, at the time of invention, to modify Burt US 5,473,364 in view of Iijima et al., US 6,236,748, to have CCD cameras in order to update the camera system with a most modern technology.

In regard to claim 7, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus of claim 1, wherein said cameras are mounted in the vicinity of a rear-view mirror of a vehicle, said cameras taking photographs of views outside the vehicle (see figure 4a & b).

In regard to claim 9, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus as recited in claim 1, but does not disclose that a first acute angle defined between said optical axis of said main camera and the baseline is

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smaller than a second acute angle defined between said optical axis of said sub-camera and the baseline.

It would have been obvious to one skilled in the art that since both cameras can be adjusted freely in the horizontal direction, the sub-camera would be pivoted less than the main camera in order for the camera, to have the same field of view.

In regard to claim 10, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus as recited in claim 9,

wherein the first acute angle is ~~larger~~ smaller than the second acute angle in order to provide a search margin in a comparative image photographed by said sub-camera to enable detection of an infinite distance corresponding point positioned at an end of said sub-camera side in a reference image by said main camera (see Iijima: column 4, lines 4-11: It is inherent that the positioning of the cameras as claimed provides for the use to provide a search margin in a comparative image photographed by said sub-camera to enable detection of an infinite distance corresponding point positioned at an end of said sub-camera side in a reference image by said main camera).

In regard to claim 13, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus as recited in claim 3,

Wherein the optical axis of said sub-camera is inclined toward said sub-camera side with respect to the optical axis of said main camera in order to provide a search margin in a comparative image photographed by said sub-camera to enable detection of an infinite distance corresponding point positioned at an

end of said sub-camera side in a reference image by said main camera (see Iijima: column 4, lines 4-11: It is inherent that the positioning of the cameras as claimed provides for the use to provide a search margin in a comparative image photographed by said sub-camera to enable detection of an infinite distance corresponding point positioned at an end of said sub-camera side in a reference image by said main camera).

In regard to claim 16, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus as recited in claim 1,

wherein angles of inclination of said main camera and said sub-camera are set to be such angles that an area being substantially left-right symmetric with respect to a central axis of a vehicle parallel to the shooting direction (see Burt: figure 4b, elements 400-1 and 400-2: It is inherent that when the camera stay is aligned perpendicular to the vehicle's central axis, the area the two cameras capture is left-right symmetric because the cameras are aligned to capture a stereographic image), the area being obtained by an image processing unit on the basis of images photographed by said cameras (see Burt: column 5, line 55-67).

In regard to claim 21, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus as recited in claim 1, wherein said predetermined length of said search area is longer than length of said region (see Iijima: figures 9A & B).

In regard to claim 22, Burt US 5,473,364 in view of Iijima et al., US 6,236,748, discloses the stereo camera apparatus as recited in claim 1, wherein said angles of inclination of said main camera and said sub-camera correspond to a displacement

between a first line on said reference image and a second line on said reference image, said first line is a line for setting a three-dimensional distance distribution, generating area on said reference image substantially symmetrical on left and right sides with respect to said first line in said reference image said second line is a vertical line perpendicular to said optical axis of said main camera in said reference image (see Iijima: figures 2 and 9a & b and column 3, lines 33-55).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gevell Selby whose telephone number is 571-272-7369. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on 571-272-7593. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gvs


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PRIMARY EXAMINER